Galanz

USER'S MANUAL

AIR-COOLED HEAT PUMP MODULAR CHILLER

LSQWRF30AM/TB(-B)
LSQWRF40AM/TB(-B)
LSQWRF50AM/TB(-B)
LSQWRF65AM/TB(-B)
LSQWRF75AM/TB(-B)
LSQWRF100AM/TB(-B)
LSQWRF130AM/TB(-B)
LSQWRF150AM/FB(-B)
LSQWRF200AM/FB(-B)

Thank you for choosing our AIR-COOLED HEAT PUMP MODULAR CHILLER. Please read this OWNER'S MANUAL carefully prior to using and keep it for further reference.

INSTRUCTIONS

1. Please read this manual carefully before starting installation of the unit.
2. Installation and maintenance of this air-cooled heat pump modular chiller should only be carried out by trained or qualified personnel.
3. When installing the unit, please observe the instructions in this manual exactly.

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Necessary Information

Notice

1. Do not put hands or foreign bodies into air outlet of the unit, or the rotating fan may cause injury.
2. Do not dampen the electric control system to avoid short-circult or equipment damage.
3. Reinstall the cleaned air filter to its original state in time. Do not use the unit without air filter to avoid affected performance.
4. Set the room temperature properly, especially there are the olds, children, or patients presented.

Safety Precautions

Make sure you've read the Necessary Information section in this manual before using our Air-cooled Heat Pump Modular Chiller. It provides very important tips on safety and proper usage of the unit. Be sure to observe the rules exactly to operate the unit.

Meanings of symbol in this manual

Warning Incorrect operation may cause death, heavy injury or damage or other severe consequence.

Notice Improper usage may cause accidents, equipment damage or reduced performance.

Please read the labels on main unit carefully. If anything abnormal such as unusual noise, smell, smoke, temperature rising, electric leakage or fire occurs , please cut off power immediately. Contact the local service center or dealer, and do not fix the unit by yourself. If necessary, contact the local fire station or emergency department.

Warning

Do not install this unit by yourself. Installation can only be undertaken by dealer or authorized professional installation company, or accident and reduced performance may occur.
2. Do not dismantle sheet metal of this unit by yourself, or personal injury or equipment damage may occur.
3. Do not use or store fixature, paint, gas, alcohol or any other flammable stuffs around the unit, or fire may occur.
4. The main power breaker should be installed at a place where is out of children's reach to avoid a certain hazard.
5. Do not spray water or other liquid to the unit, which may cause a hazard.
6. Do not operate this unit with a wet hand, or electric shock may occur.
7. In thunder weather, please turn off the main power, or the lightening may cause a hazard or damage to the unit.
8. Do not use shared power supply and breaker. Use cables with sufficient capacity and matched earth leakage breaker.
9. Earth wire must be installed independently. Do not connect the earth wire with a gas pipe, water pipe, lightening rod or a telephone earth wire. Use designated earth wire and make sure of well connecting to avoid electric shock.
10. Do not attempt to cut off power supply directly when the unit is running to avoid accident.
11. Disconnect power supply to the unit when you are not using it for a long time to avoid accidents.
12. The wiring must be in accordance with the local rules. Install the unit with a minimum distance of 800mm away from the nearby buildings.
13. For equipments with fixed wiring, a all poles separated switch must be employed for the user unless there have been a switch in compliance with chapter 24.3 of international safety standard. For detail, please see the wiring diagram on the unit.
14. An earth leakage breaker must be installed in the circuit, and its rated working current should be agreeing with the max. input current of the unit (take the value on the nameplate as standard).

Usage Precautions

1. There are two ways of control for our products: one is touch control, and the other is wire control. They are applicable for models without "-B" and with "-B" respectively.
2. To prevent unexpected operation, the first touch is just to activate the touch control, and the second touch is to operate the unit. Meanwhile, the activated time can just last for 10 seconds.
3. The operating parameters, protection devices are preset before leaving factory. Do not change the setting and short-circuit the protection devices, to avoid unit damage due to improper protection.
4. The R22 refrigerant used in the unit is non-flammable and non-toxic, and it will diffuse down to the floor when leakage happens because its density is larger than air. So when installing the unit in the room, good ventilation is needed to avoid serious suffocation in case of leakage.
5. Use dry cloths dampened with neutral water to clean the unit, and do not use acidic or alkaline liquid to avoid color fading or button malfunction.
6. When refrigerant leakage happens, stop the unit immediately and contact the service center. Make sure there is no fire on the scene, for fire can make the refrigerant resolve into toxic gas.
7. When the unit is out of use in circumstance under 0 ℃, in order to prevent water pipes damage, please don't cut off the power to the unit and turn the operation mode to heating; if the unit is not to be used for a long time, please drain up the water inside the piping and cut off the power.
8. The water flow switch is very important protecting device for the water system, so the unit must have a right size such switch, and connect its protecting signal to the according output terminal of the unit; For system with external water pump, please connect its input signal to corresponding terminal and make sure the pump can be controlled.
9. To prolong the service life of the unit, please do not start the compressor frequently (less than 5 times per hour).
10. Do not drag or distort the power cables or signal cables to prevent severe malfunction.
11. When the unit is under operation, untrained persons are not allowed to touch any electrical components or buttons, or serious accidents may happen.
12. When the unit is at fault, please contact the local service center, and do not fix the unit by yourself to avoid equipment damage or personal injury.

Other Safety Precautions

1. Before operating the unit, make sure you've read the Safety Precautions, and observe them carefully.
2. Separate the strong current and weak current cables when wiring, and use designated size fuse which can not be substituted by iron wire or copper wire.
3.The work place of the unit should be far away from places of possible fire accidents. If fire occurs due to short-circuit, please cut off the general breaker immediately, and put out the fire with a dry powder fire extinguisher.
4. Cut off the power before maintaining the unit.
5. When the unit is in operation, do not touch the copper pipes on the discharge side to avoid burns, for the surface temperature can reach 100 ℃.
6. Please try not to touch the sharp edges or fins of the unit to avoid injury.
7. Do not try to relocate the unit without instructions of the professional, for it may cause unit damage even death.
8. Do not put objects on the unit, for their falling may cause dangers when the unit is running.

Instructions of Controller

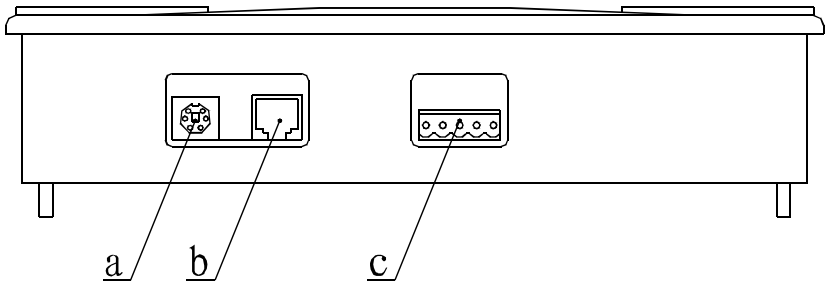
Instruction of Touch Controller

System Characteristics

1. The controller is applicable to air-cooled heat pump chiller modular unit. A single modular system is composed of a refrigeration system which contains two or three compressors, and a fan system which contains two set of condensing fans with independent or shared air system. All of the refrigeration systems and condensing fan systems make up a modular unit, and a modular network can connect 1 to 16 modular units.
2. Network control: Through simple field connection of communication cables, a network can be realized. Each module's address can be identified by the controller automatically when turning on its power, and power failure of individual module would not affect the work of other modules.
3. The controller can realize the following functions:
   Remote control and surveillance; intelligent auto-on/off operation timer (can set 5 different periods everyday in a week); shift of manual and auto control; interlinked control with terminals, faults self-diagnosis, disposal and telephone alarm; manual testing function; automatic defrosting; manual defrosting; electric heater control; freezing prevention when off duty; energy control; operation manage; load matching; PnP type network and so on.
4. The work process and functions of the controller can reach and comply the rules of Q/SKCG01-2000 and technical standards and requirements of related microcomputer controllers.
5. Good anti-interferance performance of all input and output signals and communication data transmission can ensure the unit works stably and reliably, and the output has no mis-operation, fluctuation or over 1.0 ℃ jump of temperature change.
6. The controller has mis-operation prevention function for users.
7. Safety and electromagnetic compatibility are both in compliance with the related national standards of electronic and electric appliances.
8. The setting of parameters has password protection function. All the parameters needing to set have default values, which can be used in the first time or can be restored.

Interface instructions and control panel

1. Interface instructions



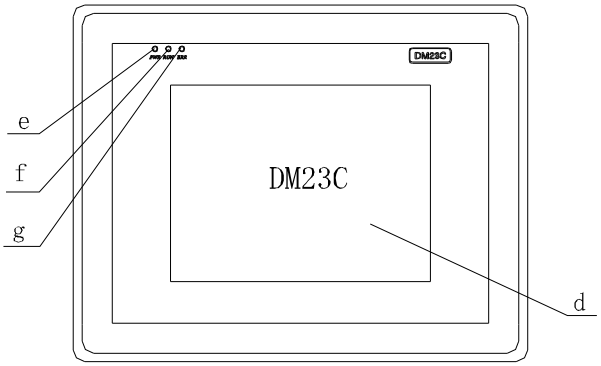
a. RS-232 standard serial communication port
   The port can connect with computer or MODEM. When connecting with a MODEM, the controller can get an access to public telecom exchange net, and can realize remote control and surveillance.

b. RS-485 standard serial communication port
   The port is to connect with I/O module port (RJ11) of control system, and communication distance can reach 1000m.

c. Power input port

2. Control panel instruction

DM23C-LY507 power communication connection diagram



d. DM23 touch display screen

Liquid crystal LCD array display.

e. Red indicating lamp

When red lamp is on, it indicates the unit has put through power; when red lamp is flashing slowly, it indicates the touch screen is in screen protection mode.

f. green indicating lamp

When green lamp is on, it indicates the unit is in operation; or it indicates the unit is stopped.

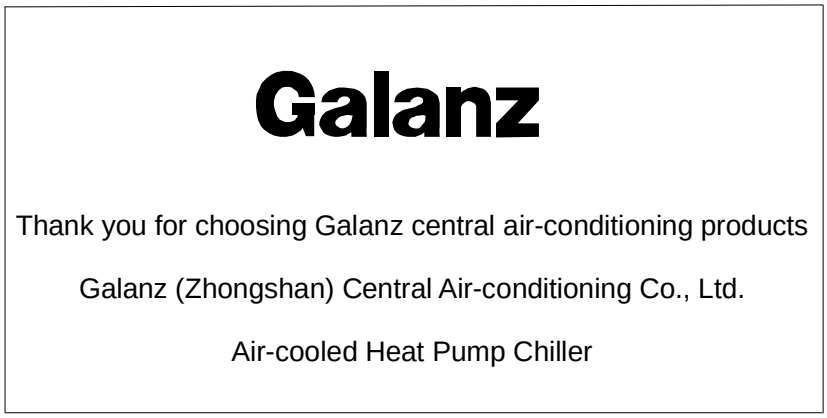
g. yellow indicating lamp

When yellow lamp is flashing fast, it indicates the unit is at fault; or it indicates the unit is normal.

Pages introduction

Note: The pages in the manual may have slight difference with real pages, but it will not bring any troubles to your normal operation and use.

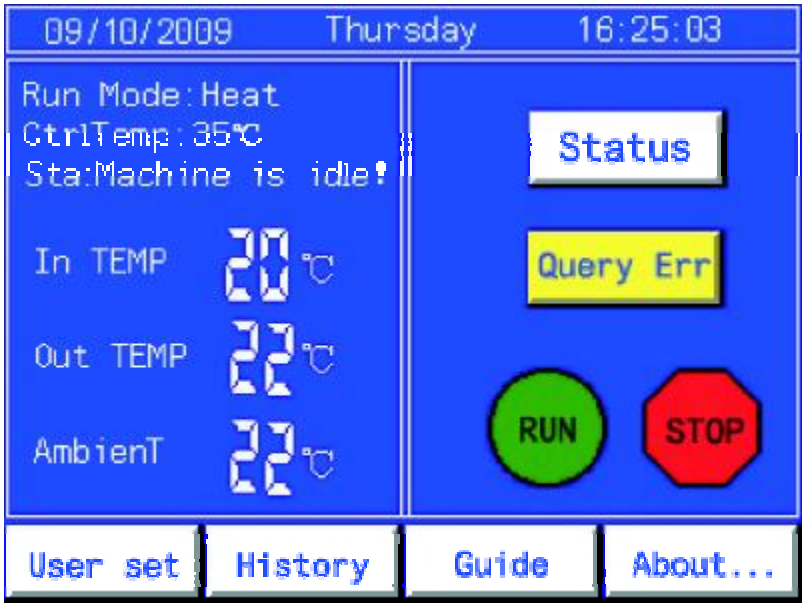
1. Start page


Galanz
Thank you for choosing Galanz central air-conditioning products
Galanz (Zhongshan) Central Air-conditioning Co., Ltd.
Air-cooled Heat Pump Chiller

Instruction:

1) The touch screen will be in start page in 10 seconds after connecting with power, the number on the upper left corner of the screen will show the counting time.
2) Touch the center of the screen for 3 seconds to enter touch location calibration operation, complete the calibration as the coming up tips.
3) Touch the lower right corner to skip the 10 seconds delay and enter the main page directly.

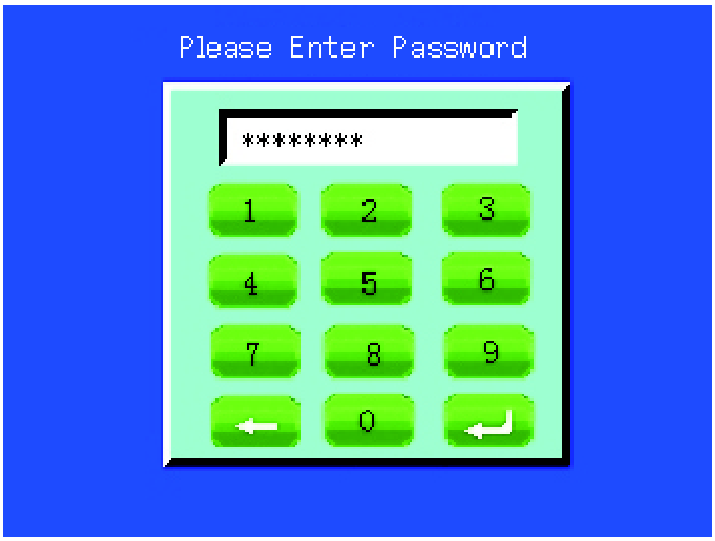
2. Main page of operation



Instruction:

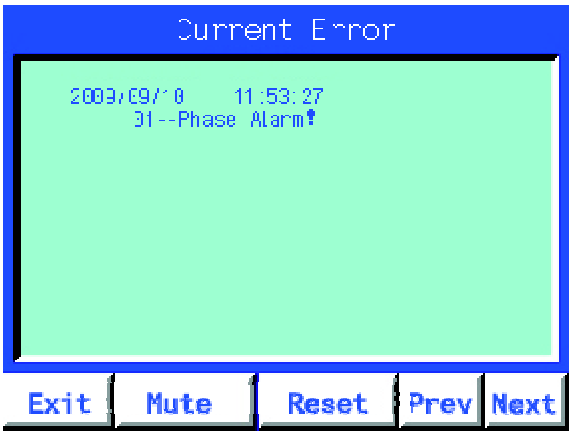
In main operation page, touch the keys to perform users' setting, history inquiry, using method inquiry and about..., state inquiry, fault inquiry, start, stop operations and so on.

3. Password entering page



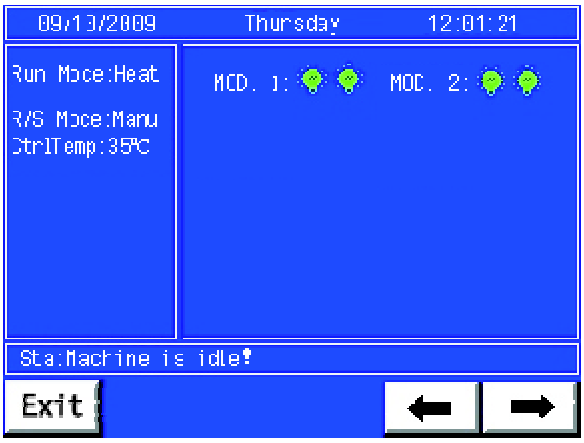
In order to facilitate management and service of the unit and reduce mis-operations, we have preset a initial password: 9999 before leaving factory, and suggest a special person to manage the service and maintenance of the unit. We have preset the parameters to their optimum states before leaving factory, so please do not change them at will. If users have to change the parameters, enter the password in password entering page, and then you can perform items setting, functions setting and so on. Press ← button when mis-input occurs; press ↵ key when confirming the items.

4. Fault page



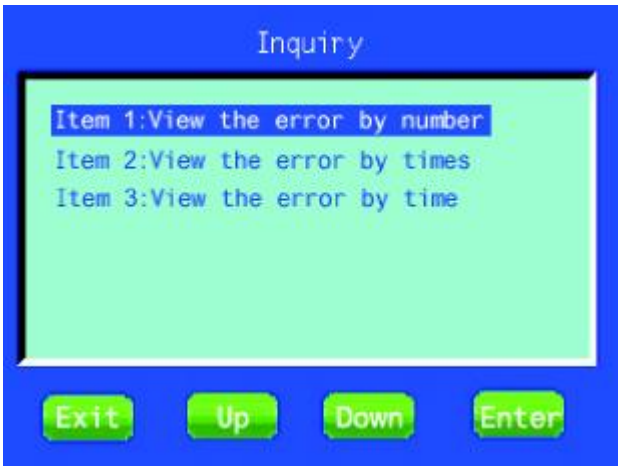
Fault page: When the unit is at fault, the beep lamp will raise an alarm, and the fault inquiry button will turn to yellow and be flashing. Touch this button to enter to fault alarm page (see above fig.), and the page will show the fault time, name and number. Push the mute button to quiet the beep, when fault is worked out, press the reset button, then the unit is normal again.

5. State inquiry page



In main operation page, press "Status" key, then you can inquiry the operation state of the unit at any time. The states which can be inquired include: the current temperature, the set temperature, the run /stop mode and output state (the lamp is on when unit is running, and the lamp is off when the unit is unloading.) etc. Push the buttons at lower right corner to inquire the individual module information such as all of input and output states. Press "input inquiry" button to see the on/off values state of the module, and press again to return to module state inquiry page; press "output inquiry" button to see the relay output state of the module.

6. History inquiry page



In main operation page, press "History" key to inquiry history faults. There are several ways to inquire history faults:
1) Inquiry faults as fault number. The smallest number fault is shown at front.
2) Inquiry faults as fault frequency. The highest frequency fault is shown at front.
3) Inquiry faults as fault time. The latest fault is shown at front.

Parameter setting

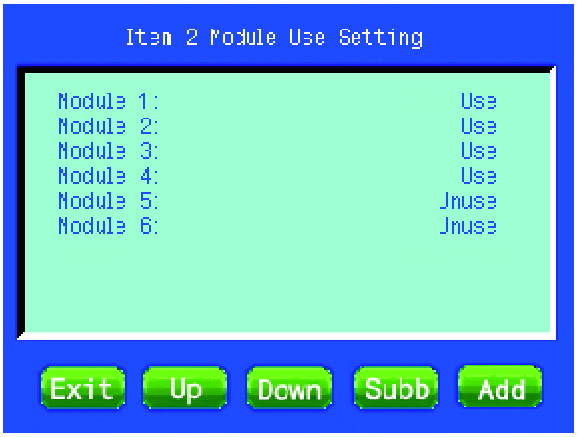
1. User setting

In main operation page, press "User set" key, and input the correct user password (or initial password) to enter to user setting page. User setting includes user parameter setting (see user setting section), time setting, module prohibition or permission setting, timer setting, contrast brightness setting, display mode setting, password modification etc. Modify the parameters as the tips：

Item 1：User parameters setting

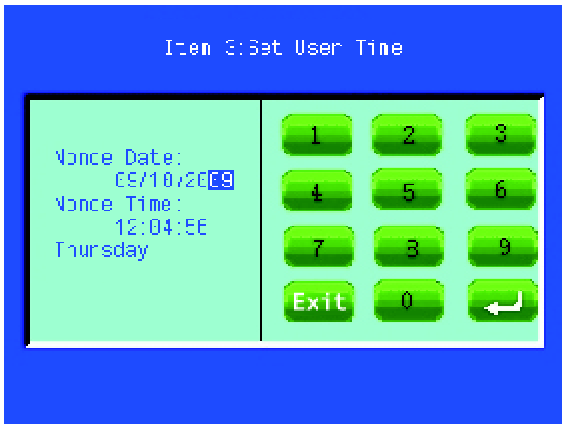
User parameters setting includes: controlled temperature and temperature difference setting; Press "Up" or "Down" key to shift the items, and press "Add" and "Subb" keys to change the values, and press "Exit" key to confirm the modification and return to upper grade menu.

Item 2：Module prohibition and permission setting



Set some modules to disabled mode, and the module 1 is defaulted as the main module, and can not be prohibited.

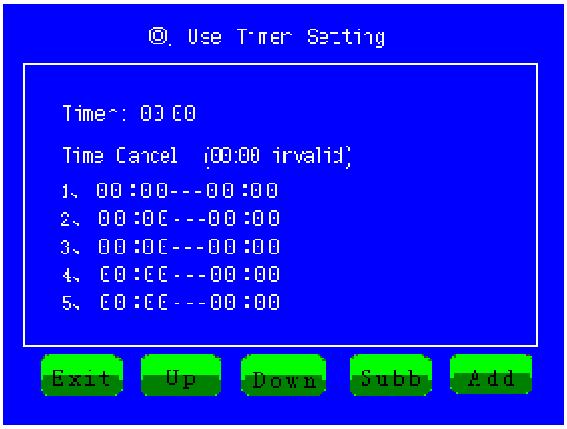
Item 3：Time setting



This page is used to change the user's time. Press key shift the changing items by entering the value directly, i.e. enter "05" for May, and the corresponding day of week will change automatically, then press "Exit" to save the change and exit.

Item 4：Timer setting

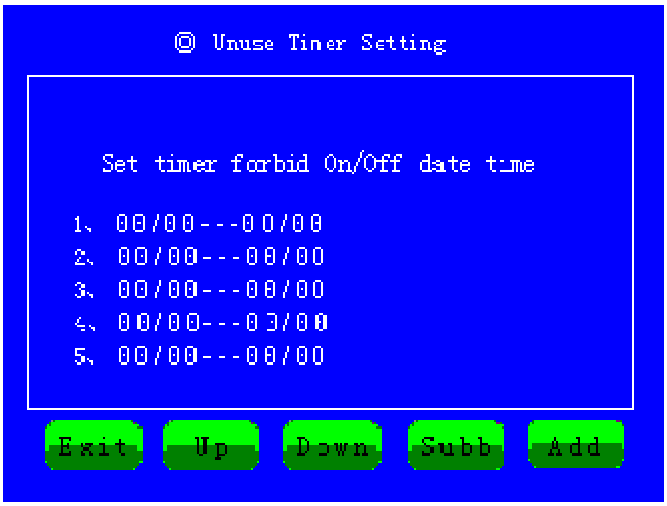
◇ To start timer setting



One time timer: If the unit is stopped, then the unit will start automatically when the set time is up; if the unit is running, then the unit will stop automatically when the set time is up;
The timer can be set as: "Everyday timer", "Mon. to Fri. timer", "Mon. to Sat. timer ". When the timer is valid, 5 periods of time can be set everyday.

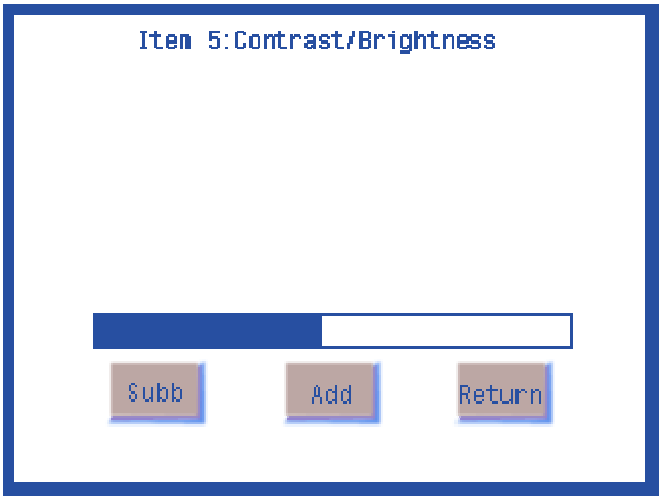
To forbid timer setting

◇



5 periods of time can not be set as timer at the same time, and in these periods of time, no matter whether the timer is valid or not, it is not functional.

Item 5: Brightness contrast setting



In "User setting" page, press "Down" key and "Enter" key to enter contrast brightness setting page, and press "Add" or "Subb" key to adjust the effect, then press "Return" key to confirm and exit.

Item 6: Display mode setting

Change the background color as the related tips.

Item 7: Modify user password

Change the user password as the related tips.

Instruction of Wire Controller

System Characteristics

1. The controller is applicable to air-cooled heat pump chiller modular unit. A single modular system is composed of a refrigeration system which contains two or three compressors, and a fan system which contains two set of condensing fans with independent or shared air system. All of the refrigeration systems and condensing fan systems make up a modular unit, and a modular network can connect 1 to 16 modular units.
2. Network control: Through simple field connection of communication cables, a network can be realized. Each module's address can be identified by the controller automatically when turning on its power, and power failure of individual module would not affect the work of other modules.
3. The controller can realize the following functions:

A. Perpetual calendar time display and setting

The calendar can display items of year, month, day, hour, minute, and second from 2000 to 2099.

The clock employs 12 hours display mode, and the time and date can be adjusted by pressing "TIME" key, "TIME ▲" key and "TIME ▼" key.

B. Auto-on/off timer display and setting

The screen can display the state and time of Auto-on or Auto-off timer. Press "TIMER" key to set the timer mode, and press "TIME ▲" key and "TIME ▼" key to adjust the set time.

C. Number display

The wire controller can display 1 to 16 unit number, and can inquire the unit with different number by pressing related keys. When the unit is at fault, the number of the unit will flash.

D. Automatic identification of controller

The wire controller can identify the connected controllers, and display their relevant data and state automatically and complete operations of different functions.

E. Distributed control

The unit can realize distributed control in parallel. That's to say, one controller can connect two or more wire controllers at the same time. These parallel wire controllers are all independent, and can display all the items and complete all operations. Users can install one wire controller at the air-conditioner main unit, and install another wire controller in the room.

F. Communication fault judgement

If the wire controller has not received any communication signals for 20 seconds, then it will release communication fault automatically, and display fault code Er00, and raise an alarm.

G. Multi-grade fault alarms display

The wire controller can identify the received alarm grade automatically.

H. Operation locking and unlocking function

To prevent mis-operation by untrained person, the wire controller employs keys locking and unlocking function. When the keys are locked, they are not available to operate.

I. The controlled equipments state display

HOP4048 series wire controller can display the controlled equipments state, such as compressor, fan, water pump and electric heater and so on.

J. Inquiry of temperature state on controller

The wire controller can inquire and display 8X16 temperatures state, and can display one main temperature in real time, such as room temperature or water temperature and so on.

E. Inquiry of parameters setting on controller

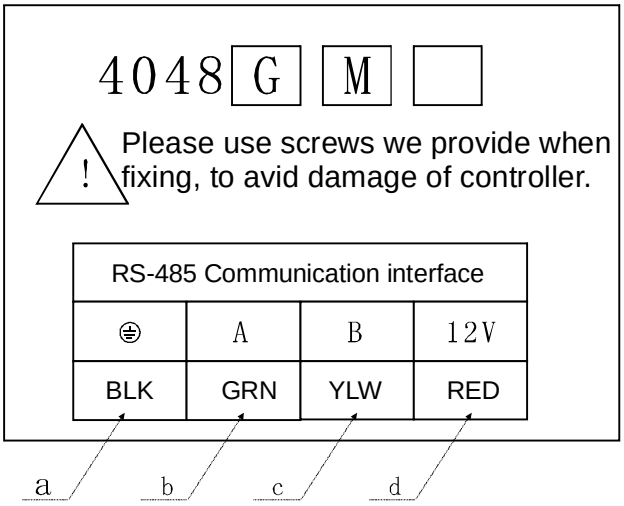
Users can inquire and set 64 parameters at most, including 16 state parameters, 8 sensor compensation parameters, 8 operation temperature parameters, 8 operation time parameters, 8 fault temperature parameters, 8 fault time parameters, and 8 defrosting parameters.

L. Manual defrosting

In heating mode, users can perform manual defrosting on any module by pressing MANUAL DEFROST key. When the controller is set as independent air system, the refrigeration system with lower fin temperature will go to defrosting, and the other system continues running. When the unit is in manual defrosting, defrosting will neglect time term, but the fin temperature can not be higher than the temperature term of end of defrosting.

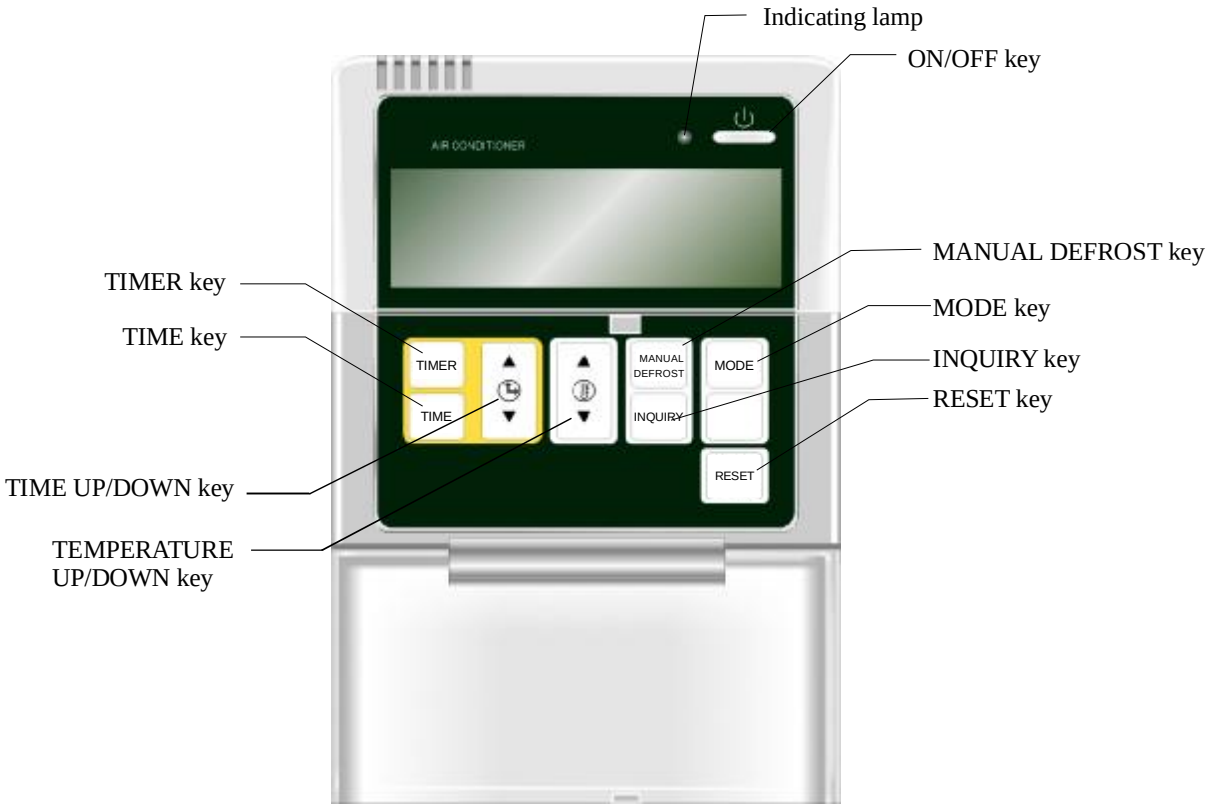
Interface instructions and control panel

1. Interface instructions



a : Earth wire
b, c :Communication interface
The interfaces are used to connect with I/O module of the control system to realize communication. The general communication distance can reach 1000m.

2. Control panel instruction



Wire controller panel

Operation instruction

1. Time adjusting

Press TIME key once to enter minute adjusting page. Press TIME key or ▲TIME key to ▼adjust the present value of minute. Every press on TIME key ▲the number increase one, and every press on TIME ▼key the number decrease one. Press TIME or ▲key ▼all the time to increase or decrease the number continuously.
Press TIME key again in minute adjusting mode to adjust the hour value.
Press TIME key to shift minute adjusting and hour adjusting. If there is no operation on the controller for a long time, system will go out of the time adjusting mode automatically.

2. Timer setting

Press TIMER key to enter timer setting mode. The sequence of timer setting: Auto-on minute adjusting → Auto-on hour adjusting → Auto-off minute adjusting → Auto-off hour adjusting → Circulating/Combined timer setting → Timer setting cancellation.

Press TIME ▲key and ▼key to adjust the setting time in timer setting mode.

2.1 Auto-on timer

If an auto-on timer is set, the unit will start when the set time is up, and the timer finishes after the unit starts. When the unit starts before the set time comes, then the timer will be cancelled.

2.2 Auto-off timer

If an auto-off timer is set, the unit will stop when the set time is up, and the timer finishes after the unit stops. When the unit stops before the set time comes, then the timer will be cancelled.

2.3 Combined timer

A combined timer contains an auto-on timer and an auto-off timer. When SA09 is set as OFF, and if an auto-on timer and an auto-off timer are both selected, then the timer is a combined timer.
In combined timer mode, the timer is finished when the auto-on timer and the auto-off timer have been executed once separately.

2.4 Circulating timer

A circulating timer also contains an auto-on timer and an auto-off timer. It's not a one time timer but a circulating timer in 24 hours. When SA09 is set as ON, and if an auto-on timer and an auto-off timer are both selected, then the timer is a circulating timer.
In circulating timer mode, the timer can work everyday.

3. Manual defrosting

In heating mode, users can perform manual defrosting on any module by pressing MANUAL DEFROST key. When the controller is set as independent air system, the refrigeration system with lower fin temperature will go to defrosting, and the other system continues running. When the unit is in manual defrosting, defrosting will neglect time term, but the fin temperature can not be higher than the temperature term of exit of defrosting.

4. ON/OFF operation

when the unit is off operation, The red lamp is on. Users can press ON/OFF key to start the unit. when the unit is in operation, the green lamp is on. Users can press ON/OFF key to stop the unit.

Note: If the wire controller has linkage function, then if it has not received linkage signal, the green lamp will flash when the unit is in operation. If the wire controller is at serious fault, the red lamp will flash.

5. Mode selection

Press the MODE key to select the operation mode of the unit. There are two modes for heat pump unit: cooling and heating.

6. Temperature setting

Press the TEMPERATURE ▲ key or ▼ key to increase or decrease the setting temperature when the unit is in operation. The maximum and minimum temperatures to be set are decided by the controller.

7. Fault inquiry

There are four types of faults on the controller: Unit recoverable faults (codes range: Pr01-Pr18); System recoverable faults (codes range: Po01-Po18); Unit serious faults (codes range: Er01-Er18); System serious faults (codes range: Eo01-Eo18);

When there is a system fault, the "UNIT" symbol will flash, and the fault code will be displayed at fault display area. When there is a unit fault, the number of the unit will flash one time per 2 seconds, and press INQUIRY key to see the fault code in fault display area.

When there is more than one fault at the same time, press TIME ▲ key and ▼ key to look up the codes.

8. Temperature inquiry

Press INQUIRY key to inquiry temperature and equipment conditions of the units. Normally, the of connected units are displayed at number display area. Press INQUIRY key to select the number of connected unit in sequence, and the selected number will flash 2 times per second.

In unit inquiry mode, press TIME ▲ key and ▼ key to see the fault codes of the unit in sequence, and press TEMPERATURE ▲ key and ▼ key to inquire all temperature conditions of the unit.

In unit temperature inquiry mode, the sensor codes from P01 to P07 will be displayed at code display area, while the corresponding temperature values will be displayed at temperature display area. The sensors which are not equipped in the controller will not be displayed.

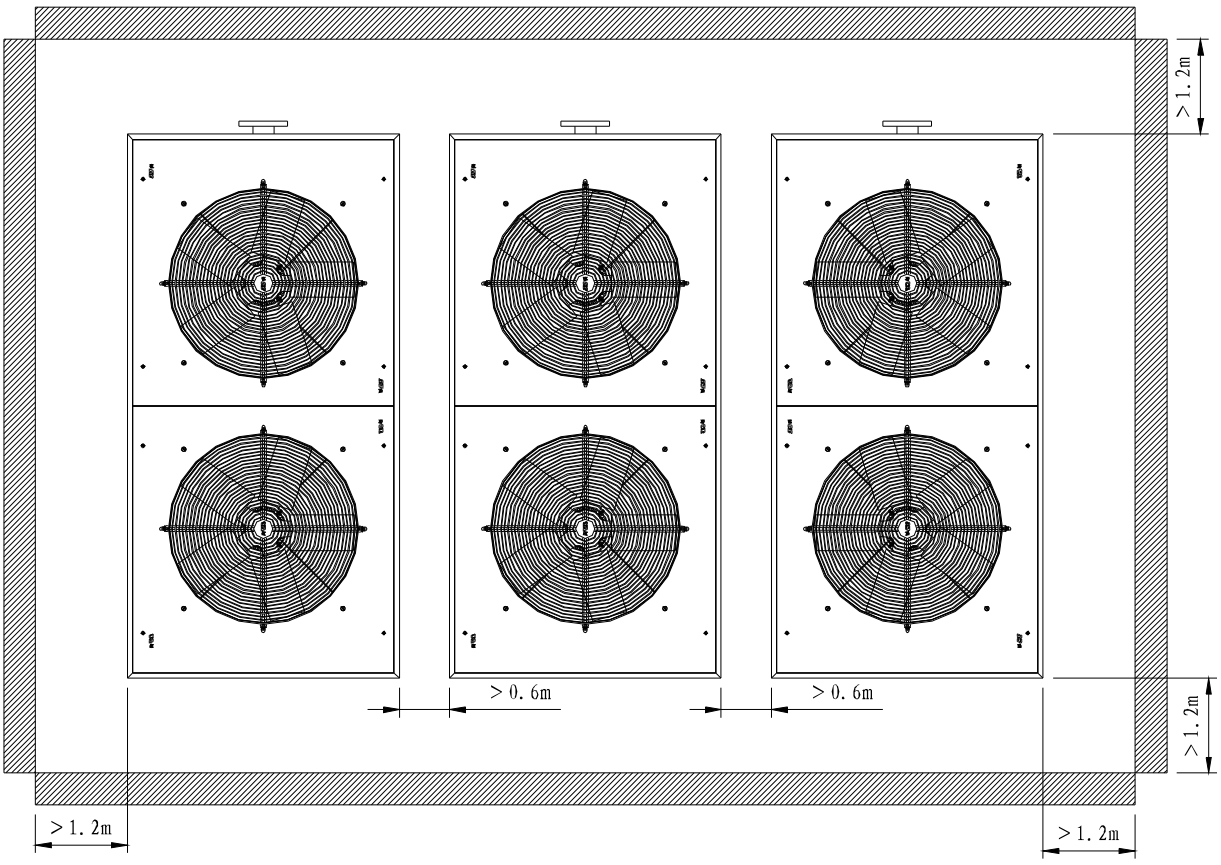
9. Equipment output conditions inquiry

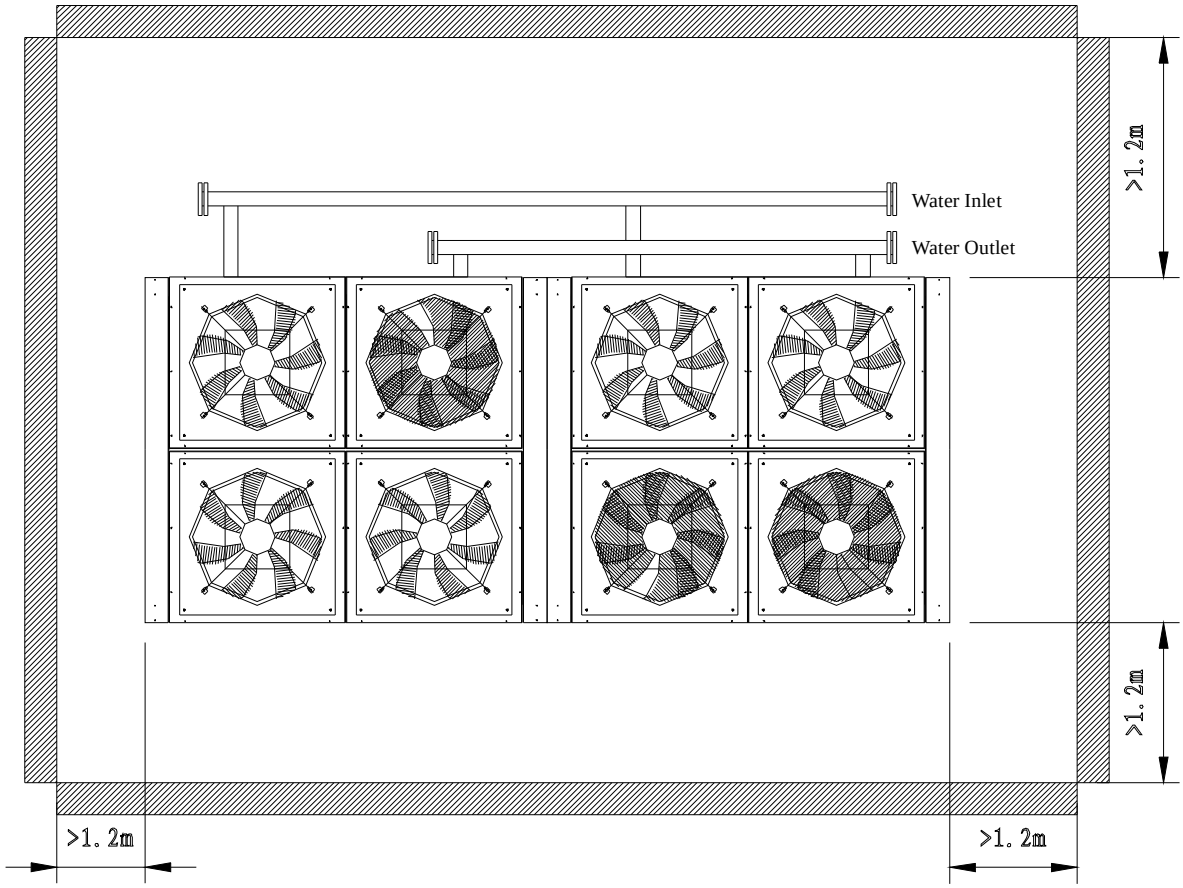
In unit inquiry mode, the controller displays the equipment output conditions of the unit.

Preparation before Installation

Location selection

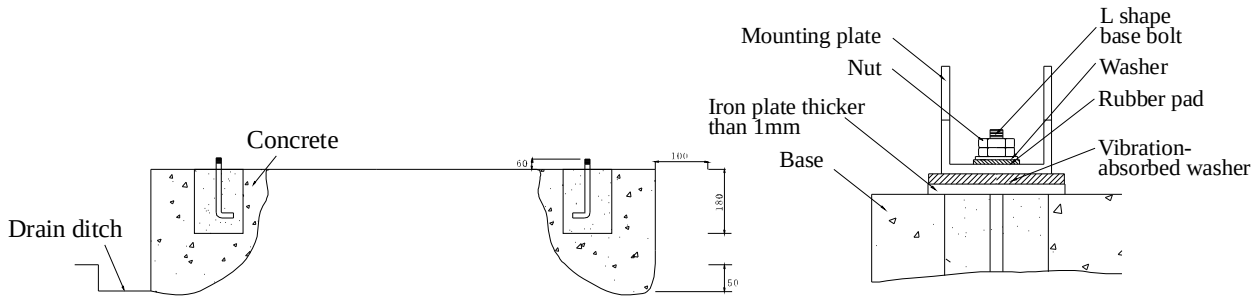
1. The unit should be installed in the clean place with good ventilation, and the air facing side of heat exchanger fins should be kept away from the direction of monsoon to avoid affected heat rejection.
2. The air discharged by the unit should not be re-sucked by itself or other units directly, if inevitable, take the method shown in the figures below as reference.
3. Avoid hot, dusty, foul, corroding, or damp places.
4. Avoid places near flammable or explosive stuffs.
5. When the unit is installed near a cooling tower, measures should be taken to prevent the entrained water drops falling onto the unit, so as not to cause electric leakage accidents, and short circuit or induction when a trial operation is on the way.
6. When installing the unit on a concrete platform, the platform must be flat and solid enough, and a vibration-absorber must be equipped at each fixing bolt.
7. The service room for the unit should be left as following figures.





Making of Installation Base

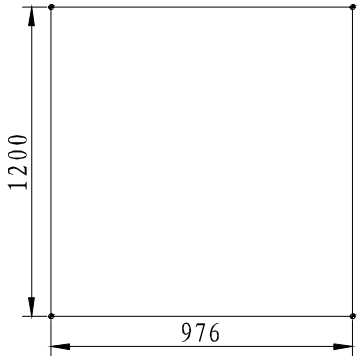
1. The installation base should be firm, solid and flat concrete platform or metal frame. The support surface should be bearable with 2 times of running weight of the unit.
2. When making the platform, place above 9.5mm diameter (3#) reinforcing bars tying with 10cm space at both upper and lower layers.
3. When building the platform on a concrete floor, roughen the floor, clean the surface, soak the floor with sufficient water, then perform building.
4. Make even mixture of concrete materials as portion of 1:2:4 (cement: sand: rubble) , pre-bury designated anchor bolts and build solid and flat platform.
5. Drain slots should be placed around the platform. The drain slot should have a slope with a gradient of over 0.5 degree to the platform edge.
6. Installation of the unit must not be performed before the concrete of the platform is dry up.
7. To achieve quiet running and prevent noise and vibration transmitting on the same floor, make sure a vibration-absorbed washer is used when connecting anchor bolt on the platform and mounting hole of the unit and keep even installation.
8. Proper position restraining measure of the unit should be taken to avoid distortion or break resulting from long periods of running, or earthquake or typhoon.
9. The concrete base should be 500mm longer than the length of the unit, and 400 wider than the width of the unit.
10. The diameter of mounting holes of RFW series air-cooled heat pump units is ϕ17mm.



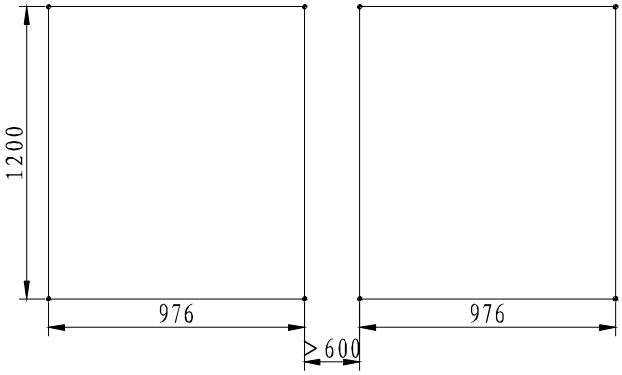
11. The position of the mounting holes of air-cooled heat pump chillers are shown below (unit: mm):

Note: The related dimensions may change due to product improvement, so consult our R&D department before making the platform.

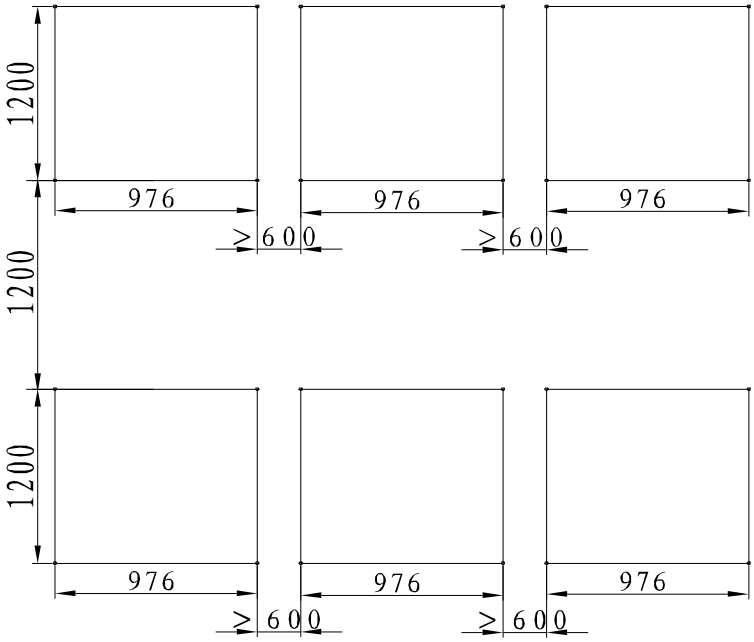
Example: LSQWRF65M/T installation arrangement sketch (the figure 600 is the distance between two units)



Single module mounting holes



Double modules mounting holes



Double column modules mounting holes

Unpacking check

Note: Unpacking check is necessary before installation. Make sure every component is in good condition before starting installation. For detail take the following procedure:
1. Make sure the surface of the unit is intact and dry.
2. Make sure the name, model, size of the units are correct, the owner's manual and the certificate of quality are both included, the accessories are agreeing with the accessory list.
3. Check the following items as table 1:

table 1

Item	Specification	Item	Specification
Unit check	1. If the metal sheet is deformed or serious scraped. 2. If the piping is intact. 3. If the pressure gauges are intact. 4. If the accessories are intact. 5. If there is a refrigerant leak.	Fan motor check	1. If the insulation is sufficient. 2. If the earth wire is well connected. 3. If the power cables are well connected.
Electrical check	1. If the control board is intact. 2. If the components on the control board are well connected. 3. If the contact is intact with well connected power cables. 4. If the earth wire is well connected.	Fan check	If the vanes are deformed and can rotate smoothly.

4. Take careful record, see table 2:

table 2

Unit name		
Unit check	1. Package	
	2. Unit check	
	3. Electrical control check	
	4. Fan and fan motor check	
	5. Others	
Files check	1. Accessories list	
	2. Certificate of quality	
	3. User's manual	
	4. Others	
Problem and remedy		
Inspector	Date	

Power supply check

1. Check the capacity of power supply, and the sizes of power cables and breaker before installation to ensure safe operation of the unit.
2. Power supply should be equipped with independent breaker with electric leakage protection function. Make sure the power meets the following requirement:

Three phases: 342-418V/50Hz

Note: If the conditions can not reach safe operation requirement, the installer should refuse to install the unit.

Unit installation

Hoisting and Fixing

1. Hoisting

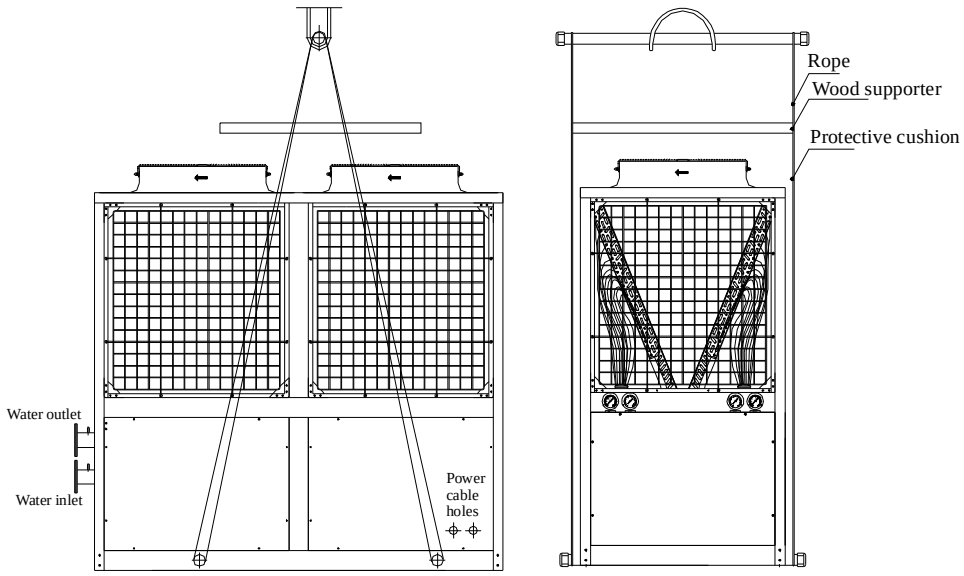
Each unit had been through strict inspection and testing before leaving factory to ensure its performance and quality. So be sure to install the unit carefully, especially do not damage the control system and piping.
The hoisting method should be planed before moving the unit, and the involved items should include entering date, external dimension, weight, route, pre-placed holes and lifting equipments, see table below:

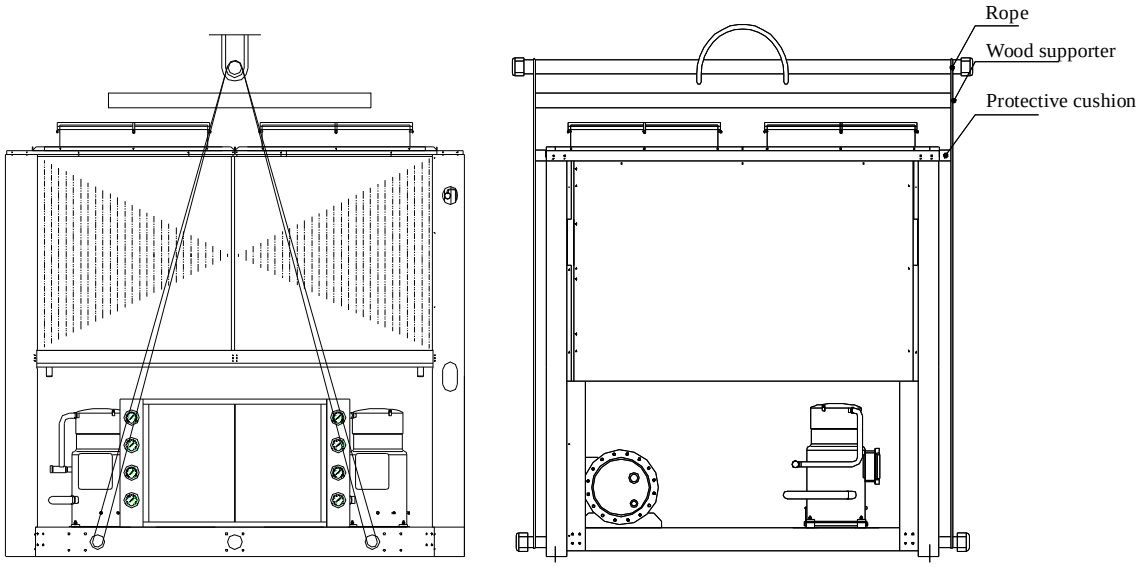
Item		Check point
Handling	Route	1. Corridor, stairway doors, and handling passage. 2. Roof, basement and lifting path.
	Unloading	1. Unit weight check. 2. Unloading equipment preparation. 3. Check the temporary deposit place and keep the unit clean.
Route adjusting		Adjust the size of pre-placed holes on the floor or wall to facilitate handling.
Other		1. Manpower and hoisting tools arrangement when hoisting. 2. Personnel and equipment security.

Notice:

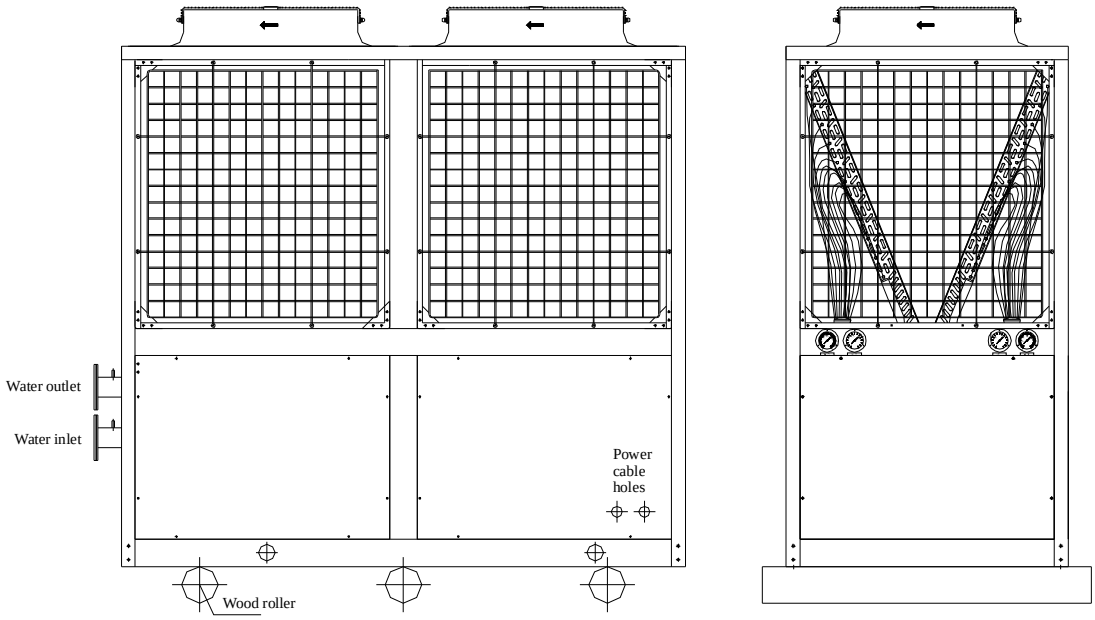
1. When hoisting the unit, the lifting rope should be bearable with at least 2.5 times of the unit weight. Protective cushion and wood supporter should be placed at the contacting points of the unit to avoid scrape of metal sheet and deformation of the unit.
2. Keep the unit horizontal when hoisting and moving the unit, and the gradient of the unit should not exceed 20 degrees.
3. Perform hoisting carefully, and use even force. When hoisting the unit, observe the security regulations of the field. The hoisting work should be commanded by a special person, and take alert measure to make sure the safety of personnel and machine.
4. Take the methods shown in the following figures as reference when hoisting or handling units of different size.

Unit hoisting profile:





Unit handling profile:



2. Fixing

After the hoisting work is accomplished, perform the following installation:

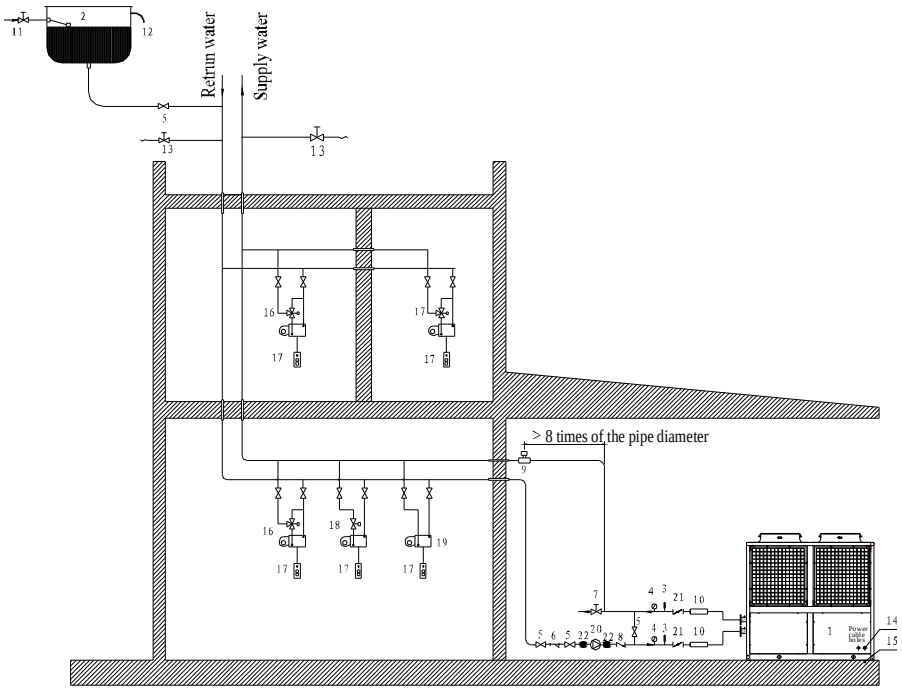
1. When the unit has been put onto the designated platform, use a level instrument to adjust the levelness of the unit to under 0.1%.
2. Confirm the levelness of the unit, then fix the unit. Each bolt should suffer even force.

Cautions of Water Piping

1. Eliminate all the foul and rust inside the water pipes before installing them. Take enclosed protecting of the pipes in the suspension of installation.
2. The water pump should be installed at water inlet side of the DX evaporator, and should equipped with rubber joints at both its inlet and outlet. A check valve should be installed at outlet of the water pump, while a Y shape filter which has at least 60 eyes should be fitted at inlet of the pump, and stop valves should be installed at both inlet and outlet of the filter.
3. Thermometers and pressure gauges should be fitted at water-in and water-out pipes of the unit to facilitate operation check.
4. The water piping should employ one or more water flow switches, which can achieve interlinked control with the unit, and which should be fitted at straight section of the pipe which is at least8 times of the pipe diameter away from the elbow.
5. A manual or automatic air discharge valve should be equipped at the top of the water piping, while a drain valve should be fitted at the bottom of the piping.
6. The water piping of the unit should be an enclosed circuit. In order to balance water expansion or contraction due to temperature change, and influence on water pressure of the piping by the separated make-up water, an expansion water tank is necessary, and its position should be at least1.5 higher than the height of the whole water system, and the water inside the tank should be sufficient.
7. The water to be chilled must pass through a filter before entering the unit, and softened water is preferred.
8. As to water piping connection, use clip fasteners for the pipes of under 32mm diameter; use flanges for the pipes of above 32mm diameter.
9. When the water piping connection is finished, a pressure test must be carried out to check the leakage, and the pressure drop should not more than 0.02 MPa under testing pressure of 0.8 MPa for 10 minutes, and there is no leaked water presented.
10. A washing of the water piping should be performed after pressure testing until there is no contaminated water flowing out.
11. After pressure testing and piping washing is well accomplished, perform piping insulation with insulation material of at least 20mm in thickness, and the insulation layer should be tied tightly without omissions or gaps. Make sure there is no dew producing outside the insulation layer in cooling.

The water piping configuration of different units is shown as below for reference:

(1) LSQWRF50M/T(-B), LSQWRF60/T(-B), LSQWRF65M/T(-B), LSQWRF75M/T(-B), LSQWRF75M/TB(-B), LSQWRF100M/TB(-B)



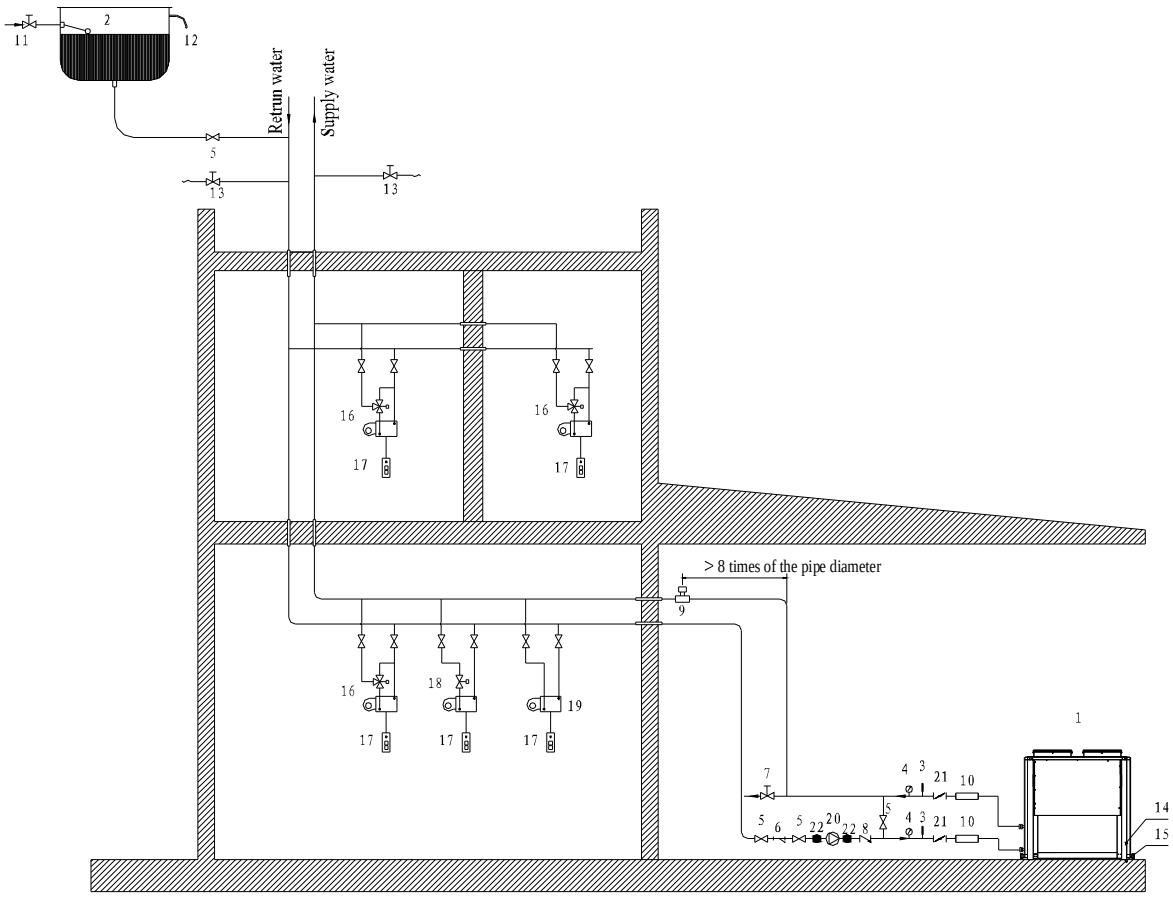
Code instruction:

1. Chilled water unit (front view) 2. Expansion water tank 3. Thermometer 4. Pressure gauge 5. Stop valve 6. Y shape filter 7. Drain valve 8. Check valve 9. Water flow switch 10. Vibration eliminating hose 11. Water make-up valve 12. Water relief valve 13. Air discharge valve 14. Power cable hole 15. Base 16. 3-way electric valve 17. Thermostat 18. 2-way electric valve 19. Terminal 20. Circulating water pump 21. Butterfly valve 22. Rubber joint

Notice:

1). The water expansion tank should be fitted 1.5 higher than the height of the whole water system to achieve pressure stabilizing, air discharge, water make-up and expansion functions, and should be fitted close to return pipe of the circulating water pump.
2). When more than one unit are connected in parallel, water distributor, water header and water pressure balance valve must be installed.
3). When the circulating water is used for the first time, close the inlet and outlet valves to the unit, open the bypass valve, start the water pump for a while, then open the inlet and outlet valves, close the bypass valve, and put the unit into use.
4). Air discharge valves must be installed at the top of both supply water pipe and return water pipe. When water piping installation is finished, make sure there is no air or impurity in the circulating water before starting the unit. Do not operate the unit with no water circulating in the piping to avoid damage.
5). The drain valve must be fitted at the bottom of the water system.
6). If all of the terminals in the enclosed branch employ 2-way electric valves, a pressure difference bypass system must be adopted between main supply water pipe and main return water pipe.
7). A water flow switch must be fitted in the water system, and the flow switch and the unit can realize linkage control, that's to say, the unit can be started only when the flow switch is in normal operation.

(2) LSQWRF130M/T(-B), LSQWRF130M/TB(-B)



Code instruction:

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7). A water flow switch must be fitted in the water system, and the flow switch and the unit can realize linkage control, that's to say, the unit can be started only when the flow switch is in normal operation.

Rules of Wiring

1. The power source should be a special branch circuit.
2. Wiring and grounding work should complied with related national standards.
3. Wiring should be performed as the wiring diagram, and the screws must be tightened.
4. When installing the unit in places where there are too much moisture or dust, please take measures to protect the wire control or touch control from moisture or dust.
5. When there is a long time power failure, say power failure for above 5 hours in summer, or above 2 hours in winter, turn on power for the unit for at least 8 hours before starting it.
6. Connect power cable to the unit through the power cable holes, or by holes drilled by yourself on the decoration plate near the control box. You can also just remove the decoration plate to facilitate wiring connection.
7. Connect the control cable (above 0.75 mm^2 with 3 cores) of the water flow switch to designated terminal strip in the control box.
8. The earth wire of the unit must be well connected.
9. Connection of communication cables of the modules is shown as fig. 1 and fig. 2.
10. For wiring diagram please see the control box of the unit.

Reference of Cable Sizes

cable sizes table

cable size (mm^2)	4	6	10	16	25	35	50	70	95	120	150	185	240	300
Allowable current (Amp)	25	36	45	60	90	115	125	155	190	225	250	285	320	400

Note: 1. Take the max. input current of the unit as standard to choose cable size according to the above table.
2. The data above is for connecting cable no longer than 12 m, if beyond this range, please choose larger cable

Main Module and Sub-module Setting & Temp. Sensor Installation

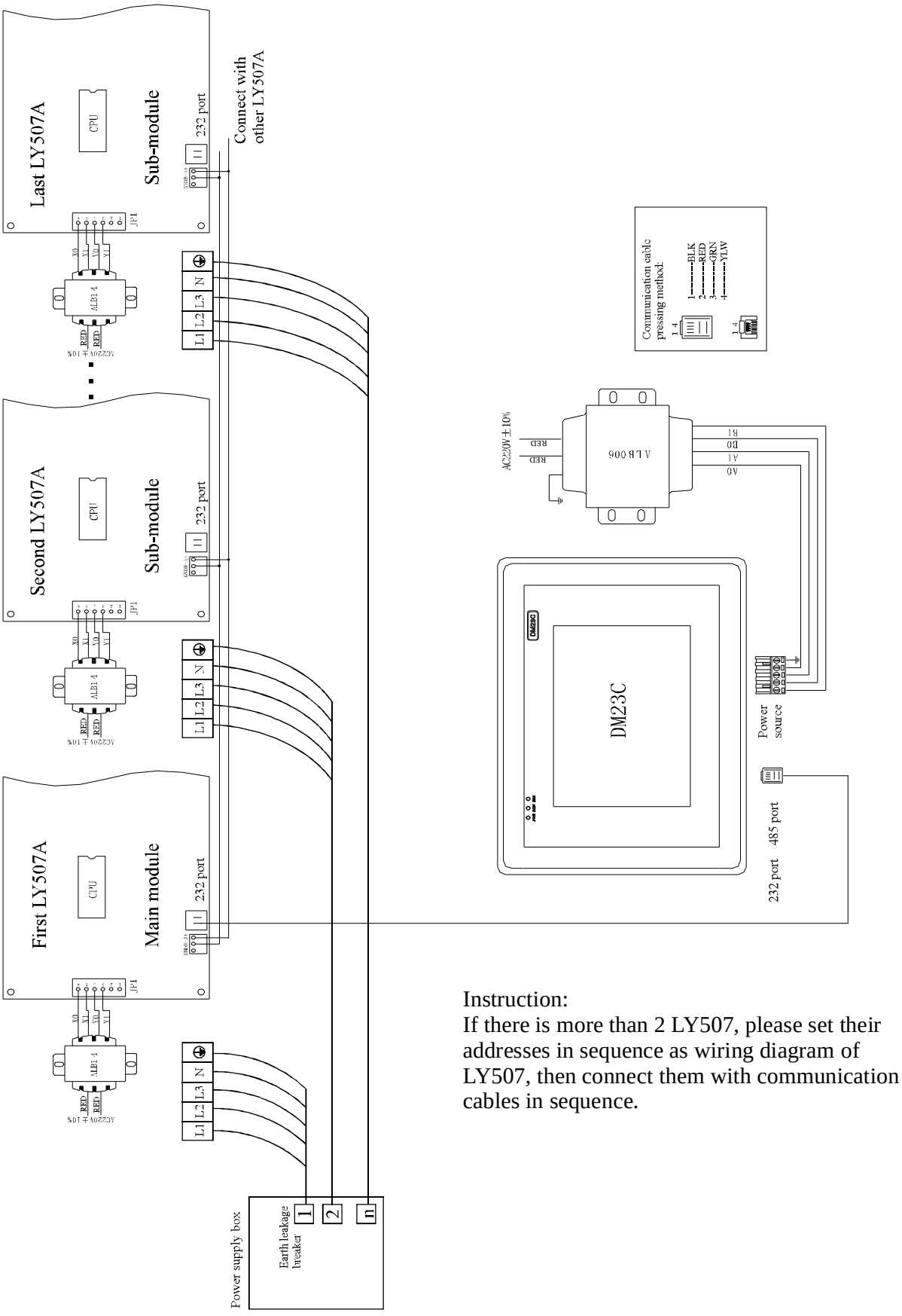
1. Make sure installation of all the units and water piping system has been completed.
2. Set the unit closest to the general inlet and outlet of the piping as main module.
3. Address setting:

Electric control address table

Network address setting					Address
5	4	3	2	1	
OFF	OFF	OFF	OFF	OFF	1
OFF	OFF	OFF	OFF	ON	2
OFF	OFF	OFF	ON	OFF	3
OFF	OFF	OFF	ON	ON	4
OFF	OFF	ON	OFF	OFF	5
OFF	OFF	ON	OFF	ON	6
OFF	OFF	ON	ON	OFF	7
OFF	OFF	ON	ON	ON	8

Network address setting					Address
5	4	3	2	1	
OFF	ON	OFF	OFF	OFF	9
OFF	ON	OFF	OFF	ON	10
OFF	ON	OFF	ON	OFF	11
OFF	ON	OFF	ON	ON	12
OFF	ON	ON	OFF	OFF	13
OFF	ON	ON	OFF	ON	14
OFF	ON	ON	ON	OFF	15
OFF	ON	ON	ON	ON	16

DM23C-LY507A power communication connection sketch (For touch screen)



Instruction:
If there is more than 2 LY507, please set their addresses in sequence as wiring diagram of LY507, then connect them with communication cables in sequence.

Figure 1

Power communication connection sketch (For wire control)

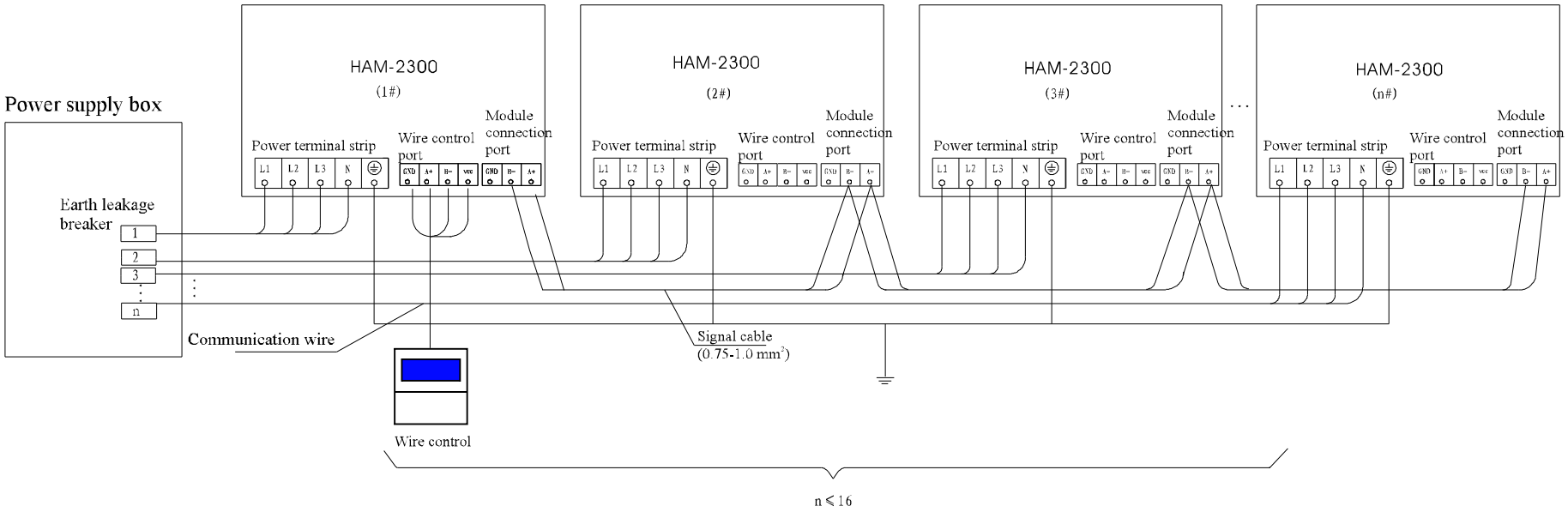


Figure 2

4. Open the accessories box of the unit, take out the temp. sensors, and confirm their model and quantity.
5. Fix the probe of the ambient sensor to the probe clip, then fasten the sensor on the surface of heat exchanger of the unit. See fig. 3.
6. Inject some heat exchange silicon grease into the sensor seat in the water-out pipe of each module, then put the leaving water sensor into the seat, then seal the exit of the seat with seal glue to ensure the precision of temperature measuring. The leaving water sensor of each module has been assembled, see fig. 4. (For touch control type, install water temp. sensor just at the water outlet, while for wire control type, install water temp. sensors at both water inlet and outlet.)
7. Fix the wire of the sensors, and keep the wire away from high temperature objects, and avoid friction with other objects.
8. Temp. sensors of general water pipes connection sketch and instruction:
a). Temp. sensor installation:
Make a hole on the surface of the general water-in and water-out pipes, then braze a copper tube of ϕ 9.52x0.5 with one end sealed in the hole, and the length of the copper tube should be 3/4 of the diameter of the water pipe. Use copper brazing method, and ensure no water leak at the seam, and the copper tube outside the water pipe should be 10 mm higher than the insulation layer, then perform sensor installation as statement of fore-mentioned point 6.
b). Weld the water flow switch seat as procedure below: Moke a hole with a gas cutting machine on the steel pipe, and make sure the hole is suitable to perform welding between the flow switch and the pipe. The seat of normal flow switches employs inner thread pipe of DN20, DN25 or DN32, please find the model of the flow switch and then buy a matched connection pipe.
c). The water flow switch has 3 contacts, one is for common terminal, and one is a normal-open contact and the last one is a normal-closed contact. (when there is no water inside the pipe, connect the common terminal and the normal-open contact to the related port of the unit.)
The normal flow switch has 5 different kinds of detecting slice to fit different water flow rates and pipe diameters. Select the slice as following: look up the manual of the flow switch according to corresponding water flow rate and pipe diameter, then find the right slice. Mind the label of flow direction on the flow switch, and make sure the flow direction shown on the flow switch complies with the practice water flow direction.

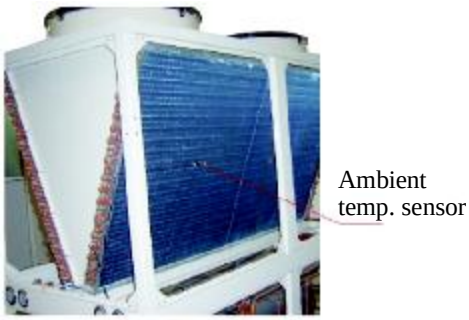


Fig. 3

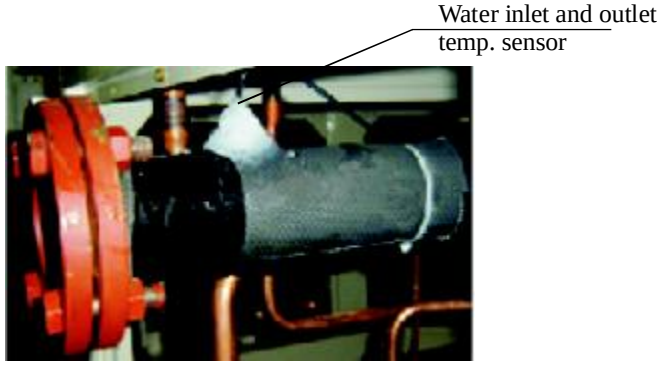


Fig. 4

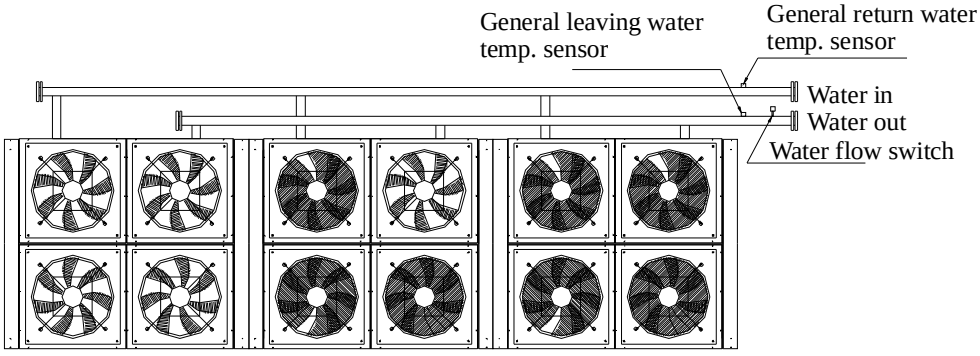


Fig. 5

Trial Operation & Maintenance

Trial Operation

1. Inspection before trial operation
1). Check if the power source is in normal and if the power complies with the designated power.
2). Check if the earth wire is well connected.
3). Check if all the wiring and switches are correct.
4). Check if the water piping is correct, and if the position of the valves is correct.
5). Check if the water system is filled with water, and if the water make-up valve is open.
6). Check if the air inlet, outlet and the air passage are not blocked.
2. Starting procedure
1). Start the air side circulating equipment such as air handling unit or fan coil unit.
2). Start the circulating water pump.
3). Start the main unit.
3. Cautions in operation
1). Electric part
A. Check if the voltage is normal after the unit has started.
B. Check if the current is normal in operation.
C. Check if the setting of high/low pressure switch, temp. switch, anti-freezing switch, and over-current relay are correct.
2). Mechanical part
A. Check if the rotating direction of the fans and the water pump is correct.
B. Check if there is abnormal noise producing by the equipment.
C. Check if the circulating pump is in good condition, and if the water pressure is normal.
4. Stopping procedure
Press the STOP button, then the unit will stop as reverse procedure automatically. Check if there is something abnormal happens when stopping.

Cautions

1. The earth wire of the unit must be connected firmly enough to avoid electric leakage.
2.The air inlet and outlet of the unit must not be blocked, or it may cause equipment damage due to reduced performance.
3. Do not put a branch, a rod, or other objects into the air outlet of the unit, since it may cause equipment damage and personal injury.
4. Do not position the air outlet of the unit facing strong wind, for the direct blowing of the strong wind will cause malfunction of the unit due to insufficient heat rejection.
5. 3 minutes is needed to restart the unit when the unit has stopped.
6. Periodic cleaning of the unit is needed to keep the good performance of the unit, for the dirty heat exchanger because of long time use will reduce the ability of heat exchanger.
7. When the unit is out of use for a long time in winter, please drain up the water inside the water piping to prevent freeze damage.
8. When using the unit in circumstance under 0 ℃, note the following to achieve correct use:
a. When the unit is not to be used, drain up the water inside the water system.
b. When the unit is used as heater just in the daytime, then in the night the water pump of the unit should continue running, or start the unit as heater according to the water temperature to avoid start failure of the unit due to ice producing.
c. For the area where the circumstance temp. is under -5℃, an auxiliary water heater is needed for the heat pump type chiller, to ensure reliable operation of the unit.
d. For the area where the circumstance temp. is under -10℃, it is not suitable to use the unit.

Instruction of Part Structure and Material Function

1. Protective devices instruction
1). High pressure switch: To prevent the pressure growing too high. Normal working range:

14-24kg.f/cm. It trips at 28kg.f/cm, and resets at 24kg.f/cm.
2). Low pressure switch: To prevent the pressure reducing too low. Normal working range: 1.5-5.5 kg.f/cm. It trips at 0.5kg.f/cm, and resets at 1.5kg.f/cm.
3). Leaving water temp. sensor: Positioned at water outlet of the unit to avoid evaporator freezing due to too low water temperature, and its default value is 3℃.
4). Thermorelay: When the operating current of the unit exceeds 15% of the rated current, it trips, and the compressor stops immediately.
5). General water inlet and outlet temp. sensors: Located at general water inlet and outlet, when the set temp. reaches, the compressors will unload in sequence; when the temp. meets the requirement of stopping term, the compressors will stop; when the water temperature arises, the compressors will start running.

2. System parts instruction
1). Expansion valve: Located at the inlet liquid pipe of the evaporator, which has the following functions:
A: To decompressing the high pressure liquid refrigerant to low temperature refrigerant, so as to absorb the load of low pressure side (When cooling, the load is water to be chilled; when heating, the load is air to be heated).
B: To adjust the flow rate of the refrigerant.
C: To prevent reverse flow of refrigerant when the unit is stopping.
2). Filter dryer: Located at liquid pipe to eliminate the impurity, water and acidic substance.

Preparation before Trial Operation

1. Connect the wire of water flow switch to the corresponding port of the control box.
2. Turn the valves to designated position when the water piping is finished.
3. Clean up the water pipes.
4. Discharge the non-condensing air in the water pipes.
5. Connect the power cable and earth cable to corresponding terminals.
6. Confirm the power phase sequence and voltage and make sure all the cables are connected firmly.
7. Make sure the power supply is available for the day of trial operation.
8. Fill the trial operation record table.

Maintenance

1. Everyday maintenance and check items
   1). The unit must be managed by a dedicated person on starting, stopping, and service of the unit, so as to prolong the service time of the unit.
   2). Check the indoor and outdoor temp., water temp., voltage and current and note them down for further adjustment and service.
   3). Clean the surface of the equipment.
2. Monthly check items
   1). Clean up the filter of air handling unit or fan coil unit.
   2). Check if there is refrigerant leakage at the joints of the piping.
   3). Check if the screws are loose.
   4). Check if the wire is worn, the connection is firm, and the contacts are burnt.
   5). Check if the oil level is normal. (for hermetic type, there is no oil view spot)
   6). Check if there is air in the water piping, if so, discharge it.
   7). Check if the pressure of the refrigerant is normal.
   8). Clean the scale on the interior surface of the condenser.
   9). Check if the water expansion tank and make-up water are normal.
3. Yearly check items
   1). In addition to the monthly check items, check if the insulation resistance valve of the compressor is above 10 MΩ.
   2). Check if the trip of the high and low pressure switch are normal.

Trouble Shooting

Electrical Faults on Wire Control (HAM-2003)

1. Unit recoverable protection

When a recoverable protection occurs on a unit, certain protection measure will be taken by the unit. Once the protection goes away, the unit will be in normal operation again. When a system recoverable fault happens, the system will stop the corresponding unit, and the number of the unit will flash on the wire control, and the fault code can be inquired by pressing the INQUIRY key.

Fault	Code	Cause	Remedy
T_{fin1} sensor fault	Pr: 01	Sensor is short-circuited or broken	The fault code will be shown
1# compressor overload protection in cooling	Pr: 04	T_{fin1} is too high in cooling	Stop the unit and show fault code
1# anti-freezing protection in cooling	Pr: 05	The outlet chilled water temp. is too low	Stop the unit and show fault code
Temp. difference protection due to low water flow rate	Pr: 06	The water temp. difference between inlet and outlet is too high	The fault code will be shown
Anti-overheat protection in heating	Pr: 07	The outlet heated water temp. is too high in heating	The fault code will be shown
T_{fin2} sensor fault	Pr: 11	Sensor is short-circuited or broken	The fault code will be shown
2# compressor overload protection in cooling	Pr: 14	T_{fin2} is too high in cooling	Stop the unit and show fault code

2. System recoverable protection

When a recoverable protection occurs on the air-conditioning system, certain protection measure will be taken by the whole system. Once the fault protected goes away, the system will be in normal operation again. When the protect happens, the fault code will flash on the wire control.

Fault	Code	Cause	Remedy
Anti-freezing protection in winter	Po: 07	The water temp. drops too low when the unit is stopped in winter	The fault code will be shown

3. Unit serious protection

When a serious fault protection occurs on a unit, the fault code will flash on the wire control, and the corresponding unit will be stopped. The number of the corresponding unit will flash on the wire control, and the fault code can be inquired by pressing the PRESS key.

Fault	Code	Cause	Remedy
1# outdoor fan protection (independent air system)	Er: 01	1# outdoor fan over-load switch trips.	1# unit stops for protection.
1# high pressure protection	Er: 02	1# high pressure switch trips.	1# unit stops for protection.
1# low pressure protection	Er: 03	1# low pressure switch trips.	1# unit stops for protection.
1# compressor overload protection	Er: 04	1# compressor over-load switch trips.	1# unit stops for protection.
Outdoor fan protection (shared air system)	Er: 06	Fan over-load protection switch trips.	Module stops for protection.
Module phase sequence protection	Er: 07	Module phase sequence and shortage switch trips.	Module stops for protection.
Module return water temp. sensor fault	Er: 08	Sensor is short-circuited or broken	Module stops for protection.
2# outdoor fan protection (independent air system)	Er: 11	2# outdoor fan over-load switch trips.	2# unit stops for protection.
2# high pressure protection	Er: 12	2# high pressure switch trips.	2# unit stops for protection.
2# low pressure protection	Er: 13	2# low pressure switch trips.	2# unit stops for protection.
2# compressor overload protection	Er: 14	2# compressor over-load switch trips.	2# unit stops for protection.
Module leaving water temp. sensor fault	Er: 18	Sensor is short-circuited or broken	Module stops for protection.

Note: In the above table, where 1# or 2# is mentioned, it means 1# or 2# refrigeration system or 1# or 2# circuit of the unit. Moreover, the 1# or 2# unit means the corresponding circuit.

4. System serious fault protection

When a serious fault protection occurs, the fault code will flash on the wire control, and all the units will be stopped for inspection.

Fault	Code	Cause	Remedy
General return water sensor fault	Eo: 01	Sensor is short-circuited or broken	All units stop for protection
General leaving water sensor fault	Eo: 02	Sensor is short-circuited or broken	All units stop for protection
Ambient temp. sensor fault	Eo: 03	Sensor is short-circuited or broken	All units stop for protection
Main module water flow switch protection	Eo: 05	Water flow switch trips after the main module starts.	All units stop for protection
Main module phase sequence protection	Eo: 07	Main module phase sequence and shortage switch trips	All units stop for protection

5. Communication fault

When communication fault occurs, all the units will be stopped for inspection.

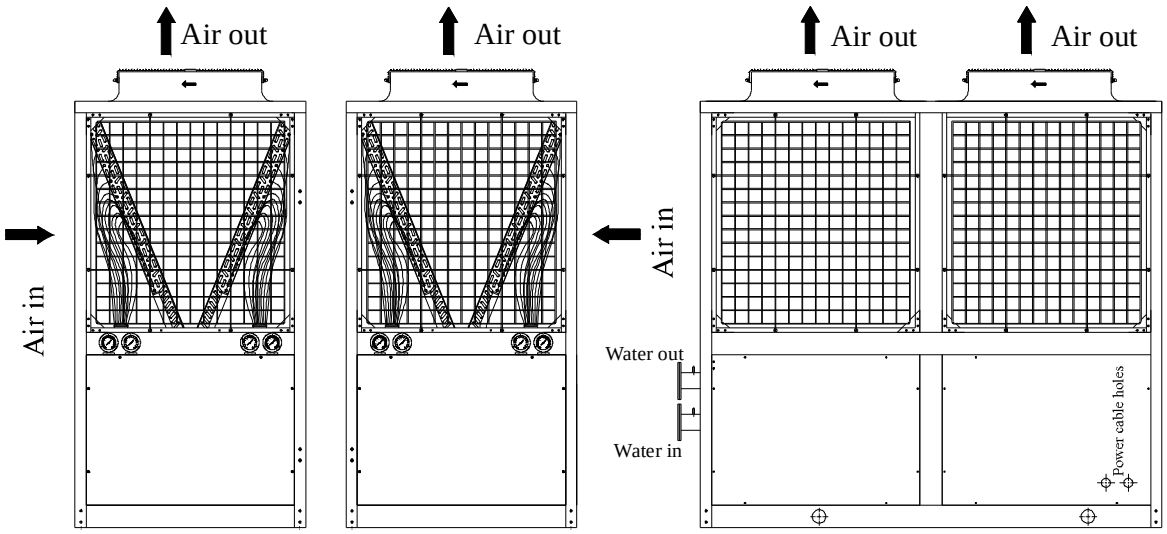
Fault	Code	Cause	Protection measure	Term of recovery
Communication fault	Eo: 00	Communication goes wrong	Wire control raises an alarm	Communication circuit recovers

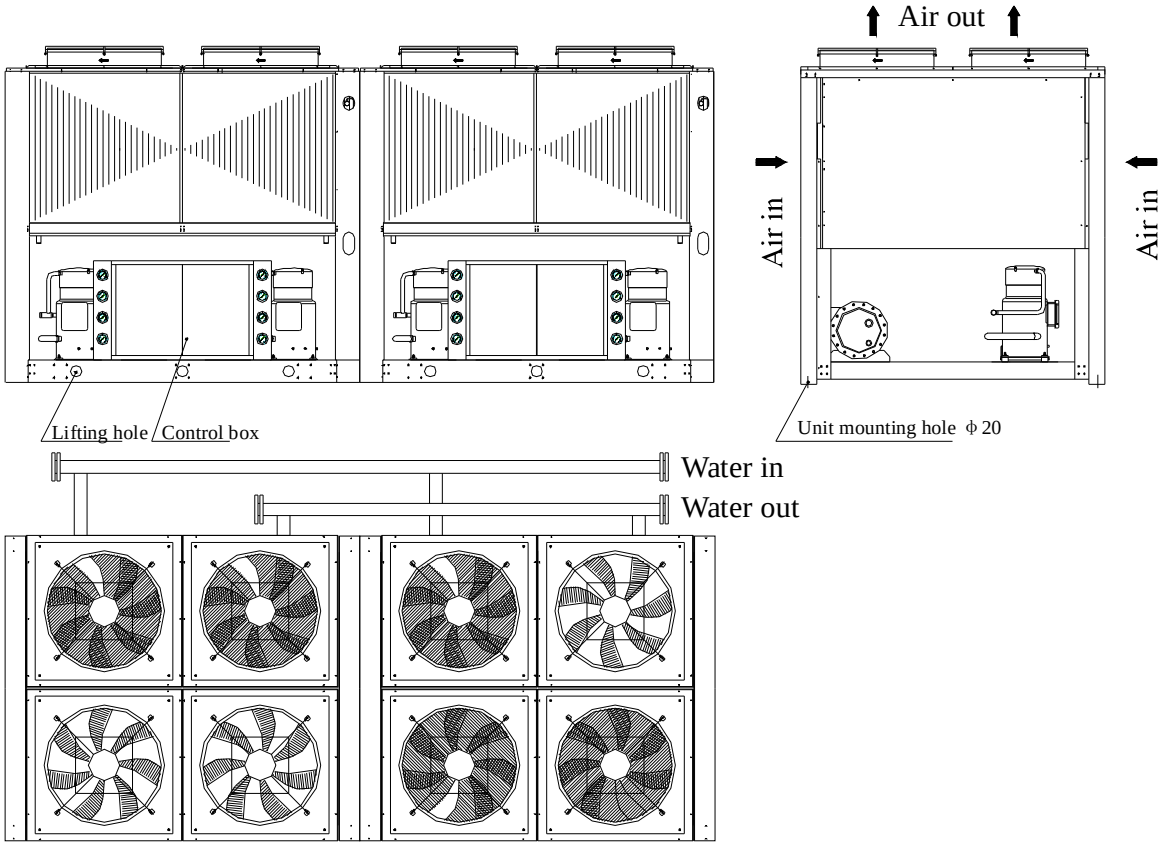
Trouble shooting

Fault	Cause	Remedy
The fan, water pump, and compressor all can not start.	1. Power failure.	1. Wait for power recovery.
	2. Power switch trips.	2. Find the cause then turn on the power again.
	3. The fuse is blown.	3. Replace the fuse.
	4. The water pump over-load protector is at fault or not reset.	4. Check the protector then reset it. If the pump goes wrong, repair it.
The water pump is running but the compressor can not start.	1. The return water temp. is set too high (in cooling).	1. Adjust the set return water temp.
	2. Temp. sensor is at fault.	2. Repair or replace it.
	3. The compressor current over-load protector is not reset.	3. Check the protector then reset it.
	4. The return water temp. is set too low (in heating).	4. Adjust the set return water temp.
	5. Protection switches of the unit trip and are not reset.	5. Check the switch then reset it.
The compressor stops after it has just started.	1. The air inlet or outlet is blocked.	1. Move away the obstacle.
	2. The condenser is too dirty.	2. Clean up the condenser.
	3. The installation space is too small, and can not achieve good air circulation.	3. Improve the condition yourself.
	4. The fan goes wrong.	4. Repair the fan.
	5. There are some valves which are not opened.	5. Open the water valves which should be opened.
	6. The water flow rate is too low.	6. Check the water valve, and discharge the air inside the pipes.
	7. There is a refrigerant leakage.	7. Find the leakage, then fix it.
	8. The compressor current over-load protector is not well adjusted.	8. Adjust the set valve.
Cooling becomes heating.	1. Mis-operation	1. Check the operation, and turn the mode to cooling.
	2. The four-way valve is at fault	2. Replace the four-way valve.
Heating becomes cooling.	1. Mis-operation	1. Check the operation, and turn the mode to heating.
	2. The four-way valve is at fault	2. Replace the four-way valve.
Water temp. difference is too high between inlet and outlet, and the low pressure is too low (when cooling).	1. The valves are not correctly opened or closed, and the pipe is blocked.	1. Check the water valves and fittings.
	2. There is too much air in the water.	2. Discharge the air in the water pipes.
Water temp. difference is too high between inlet and outlet, and the high pressure is too high (when heating).	1. The valves are not correctly opened or closed, and the pipe is blocked.	1. Check the water valves and fittings.
	2. There is too much air in the water.	2. Discharge the air in the water pipes.

Unit Name & Figure Dimensions

Unit Name



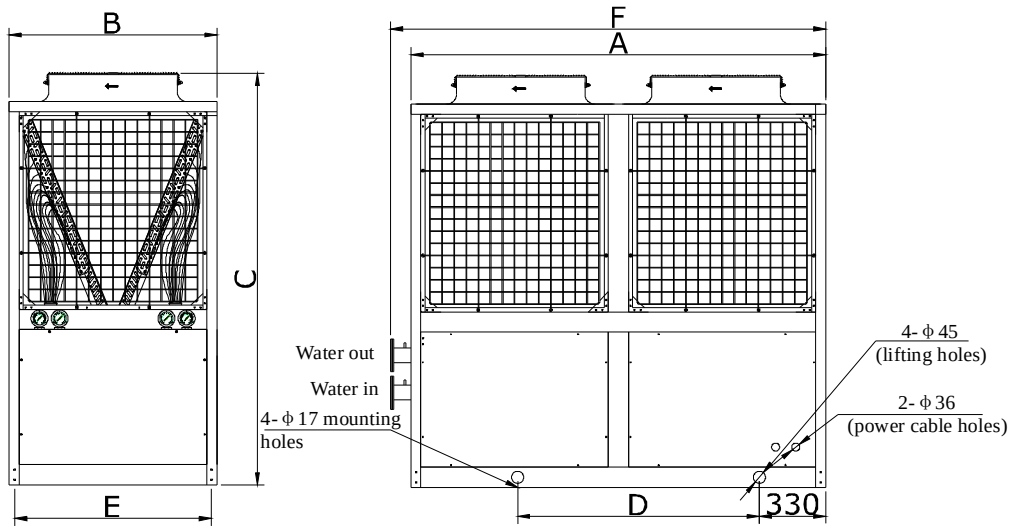


Note: The figures above are for standard models, and special models are not shown here.

Figure Dimensions (unit: mm)

Note: The figure dimension of real units may have changed due to products improvement, so please take the real unit as final reference.

Air-cooled heat pump modular chiller

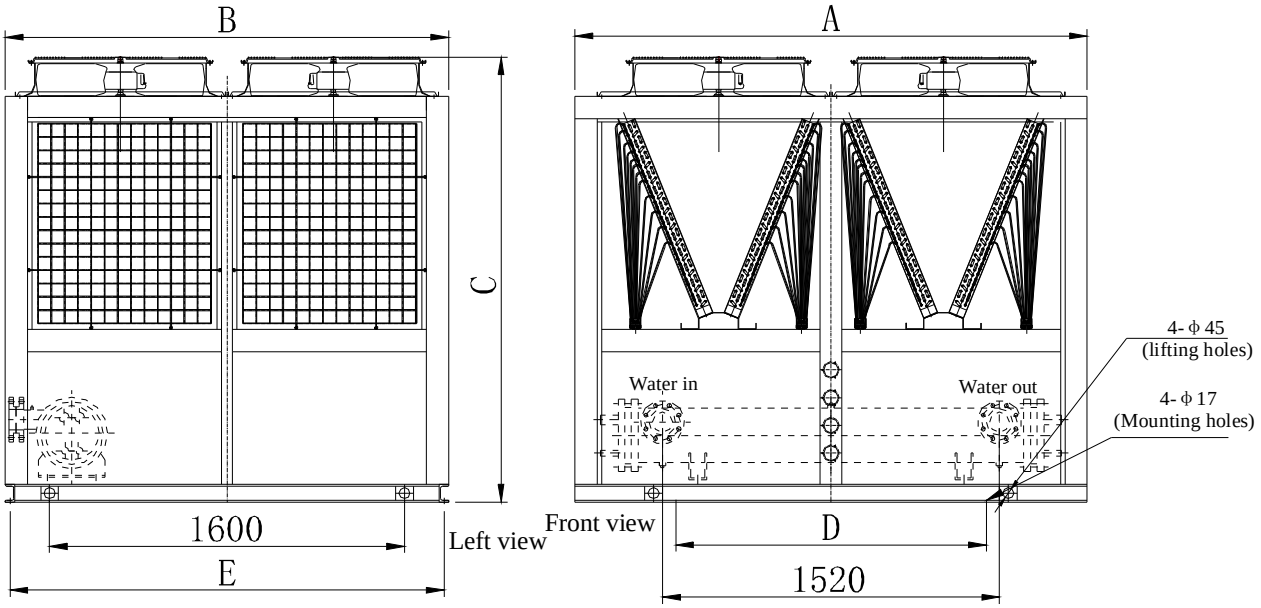


LSQWRF50M/T(-B) LSQWRF65M/T(-B) LSQWRF75M/T(-B)

SQWRF65M/TB(-B) LSQWRF75M/TB(-B) LSQWRF100M/TB(-B)

Unit: mm

Code / Model	Unit dimension			Installation dimension		
	A	B	C	D	E	F
LSQWRF50M/T(-B)	2060	1030	2030	1200	976	2160
LSQWRF65M/T(-B)	2060	1030	2030	1200	976	2160
LSQWRF75M/T(-B)	2060	1030	2030	1200	976	2160
SQWRF65M/TB(-B)	2060	1030	2030	1200	976	2160
LSQWRF75M/TB(-B)	2060	1030	2030	1200	976	2160
LSQWRF100M/TB(-B)	2460	1030	1980	1600	976	2560



LSQWRF130M/T(-B)　LSQWRF130M/TB(-B)　**LSQWRF200M/FB(-B)**

Unit: mm

Code	Unit dimension			Installation dimension	
	A	B	C	D	E
LSQWRF130M/T(-B)	2310	2000	2005	1400	1957
LSQWRF130M/TB(-B)	2310	2000	2005	1400	1957
LSQWRF200M/FB(-B)	2310	2000	2005	1400	1957